

The tortuous trails of long-term language change: cyclic exaptation

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Language change

- The rate of change in languages is fast:
 - Cultural evolution
 - Sounds may change within one generation
 - Words have a linguistic half-life of roughly 2k – 4k years. Some highly frequent words have half-lives of 10k or 20k years. (Pagel et al. 2013).
Non-cognates: Old English *niman* vs. *tacan*
 - But even cognates tend to be mutilated beyond recognition within several thousand, or even hundred years: English *lɔ:d* < Old English *hláfweard*

Language change

- Grammar:
 - Grammar (syntax and morphology) is more stable than phonology
 - *Eppur Si Muove*
 - Non-regular:

“(…) malgré certaines apparences contraires, les événements diachroniques ont toujours un caractère accidentel et particulier.” (De Saussure, 1955:131)

“Ainsi les faits diachroniques sont particuliers; le déplacement d'un système se fait sous l'action d'événements qui non seulement lui sont étrangers (...), mais qui sont isolés et ne forment pas système entre eux.” (De Saussure 1955:134)
 - Regular: long-term ‘drifts’ (e.g. synthetic > analytic), grammaticalisation



Exaptation

"[T]he establishment of parallels with historical biology may provide one of the most profitable future directions for historical linguistics"
(McMahon 1994:340, cited in Simon 2010:42)

Application of evolutionary thinking to historical linguistics: Lass (1997); Nettle (1999); Croft (2000); Givón (2002); Blevins (2004); Ritt (2004); Rosenbach (2008); Mufwene (2008); Landsbergen (2009); Simon (2010); Steels (2011); Van de Velde & Van der Horst (2013); Van de Velde (forthc.) ...

Much discussion: what is the replicator (~ genotype) (languages, constructions, utterances, grammar ... ?)

Exaptation

- Gould & Vrba (1982)

TABLE 1. A taxonomy of fitness.

Process		Character	Usage
Natural selection shapes the character for a current use—adaptation		adaptation	function
1	A character, previously shaped by natural selection for a particular function (an adaptation), is coopted for a new use—cooptation	} aptation	} effect
2	A character whose origin cannot be ascribed to the direct action of natural selection (a nonaptation), is coopted for a current use—cooptation		

- Example: Vertebrate skeleton is an exaptation of a calcium-phosphate storage device

Exaptation

- Application to language change: Lass (1990)
 - Functionless morpheme ('junk') has 3 options:
 - i. it can be dumped entirely;
 - ii. it can be kept as marginal garbage or nonfunctional / nonexpressive residue (suppletion, 'irregularity');
 - iii. it can be kept, but instead of being relegated as in (ii), it can be used for something else, perhaps just as systematic. ⇐ EXAPTATION
 - Revision in Lass (1997): the notion of 'junk' is not essential
- Example: Eng. Pret. -t/-ed (*burnt/burned; leapt/leaped*) > aspectual difference (durativity) in Br.Eng. (Bolinger 1980, Levin 2009)
- Further examples: Lass (1990, 1997); Norde (2002); Heine (2003); Fudeman (2004); Van de Velde (2005, 2006); Narrog (2007); Booij (2010); Simon (2010); Willis (2010); Wischer (2010); Smith (2011), Norde & Van de Velde (in prep.) ...

Exaptation

- Critique:

“Every adaptation is one sort of exaptation or the other – this is trivial, since no function is eternal; if you go back far enough, you will find that every adaptation has developed out of predecessor structures each of which either had some other use or no use at all” (Dennett 1996:281)

⇒ Different positions:

- i. Leave biological notions to biology (Andersen 2006)
- ii. The notion of exaptation is problematic, both in biology and in language (De Cuypere 2005)
- iii. The notion of exaptation is not needed in biology, but can be useful in other fields, incl. linguistics (Larson et al. 2013)
- iv. The notion is useful, but we have to be wary of differences and difficulties

Exaptation



- Useful notion:
 - Terminological parsimony
 - It captures something intuitively real: opportunistic re-use of existing material to a new, unrelated function
 - 'junk(oid) material': biology < linguistics < technology
 - Biology: wisdom teeth, goose bumps, hiccups, blind gut
 - Linguistics: obsolescent morphology (old case marking, intransparent derivational morphology)
 - Technology: rampant: horse shoes, microwave radiation, Trinidadian steel drum ... (Larson et al. 2013)
- Important: language change is not teleological (as opposed to technology)
- Rather: local generalisations (Van Marle 1990; Joseph 1992, 2004; Albright 2002; Enger 2013; Van de Velde & Van der Horst 2013; Van de Velde & Weerman forthc.)

Cyclic exaptation

- In biology
- In language
- Aim: to show that exaptation is a common process.

Cyclic exaptation

- In biology: feathers
 - Adaptation for insulation
 - Exaptation (co-optation) for:
 - Enlargement of hand surface area (to catch insects)
 - Flight
 - Mantling behaviour in black herons (for fishing) ([movie](#))
 - Sexual selection
 - ...



Archaeopteryx fossile:

- fully feathered
- underdeveloped flying skills

Cyclic exaptation

- In language:
 - Nominal domain: n-inflection in Germanic
 - Verbal domain: o-grade in Germanic
 - Word order/clause combining: V1 in Germanic

Case study 1: nominal n-inflection in Gm.

- Word structure in PIE

[_N [_{stem} (ablauting) root (+ stembuilding affix)] + inflectional ending]

e.g. *dhǵh-ǵh-s* ('day')

- The **stembuilding affix** was originally derivational in nature, but its precise etymology is obscured in the ancient attested daughter languages

Case study 1: nominal n-inflection in Gm.

- PIE: no distinction between Adj and N (Bammesberger 1992:52; Kurzová 1993; Van de Velde 2009a, 2009b). The establishment of Adj as a separate PoS was a PGm innovation:

“The development of the adjective is perhaps one of the most conspicuous innovations in Germanic morphology. In Germanic the adjective is not only semantically delimited by generally expressing some ‘quality’ (...), but it is also morphologically clearly definable.” (Bammesberger 1992: 52-53)
- PIE ‘pronouns’ (including quantifiers) follow another inflection paradigm

Case study 1: nominal n-inflection in Gm.

- PGM: two declension types:

- Strong inflection (by infusion of the pronominal inflection)

hairdeis

gods

shepherd:NOM.SG

good:**STRONG**.NOM.M.SG

'the good shepherd' (Gothic, John 10: 11)

- Weak inflection (the old derivational **n-inflection**)

hairdeis

sa

goda

shepherd:NOM.SG

the:NOM.M.SG

good:**WEAK**.NOM.M.SG

'the good shepherd' (Gothic, John 10: 11)

Case study 1: nominal n-inflection in Gm.

-n affix

- Derivational:

"Es ist nicht zu verkennen, daß diese Wörter vorzugsweise den begriff von handeln, leben und regsamkeit auszudrücken haben, daher häufig zu appellativen von menschen, thieren, bäumen, pflanzen, gliedern des leibs dienen." (Grimm 1822:821, cited in Perridon 2011)
- Probably similar in meaning to PDE *-er* (Perridon 2011)
- Exapted to express individual-level properties as opposed to stage-level properties (Brugmann & Delbrück 1889:131, 424-426, 431, 437; Hirt 1927:149ff.; Prokosch 1939:260-161; Ranheimsæter 1945:13-14; Nielsen 1989:29-30; Braunmüller 2008; Perridon & Sleeman 2011:13).
 - Greek: *strabós* 'squinting' vs. *strábōn* 'squinter'
 - Latin: *catus* 'shrewd' vs. *cato* (stem: *caton-*) 'the shrewd one'

Case study 1: nominal n-inflection in Gm.

-n affix

- The individual-level properties (nouns, see above), were often used in apposition to proper nouns
- This has led to a reanalysis in which the weak declension was seen as a marker of (a subtype of) adjectives (Spamer 1979; Van de Velde 2006; Van de Velde et al., forthc.)
- These appositional nouns / adjectives mostly occurred in definite NPs (proper nouns ...)
- This led to a new exaptation: marker of definiteness:

"The 'indefinite' function of the 'strong' and the 'definite' function of the 'weak' declension is closely related to the individualizing sense of the former and the generalizing sense of the latter, which is still fairly clearly apparent in Modern Standard German: *gute Menschen* (*viele, manche, einige gute Menschen*) designates a limited number of individuals, *die guten Menschen* (*alle guten Menschen, diese guten Menschen*) refers to the totality of a type or at least a definite group." Prokosch (1939:260-261)

Case study 1: nominal n-inflection in Gm.

-n affix

- Marker of definiteness:

<i>sum</i>	<i>eorðlice</i>	<i>æ</i>	
a	worldly-WEAK	law	(Old English, Mitchell 1985:60)

<i>fram</i>	<i>ðisum</i>	<i>andwerdum</i>	<i>dæge</i>	
of	this	present-STRONG	day	(Old English, Mitchell 1985:58)

- Weak inflection lost its function, as definiteness became expressed by determiners
- This led to, again, exaptations:
 - In PD Dutch, the weak inflection is co-determined by gender-number features of the head noun
 - In Post-PD Dutch: marker for attributive use (A vs. D) (Van de Velde & Weerman, forthc.) (*elk man* 'each man' – *een goude armband* 'golden bracelet' ...)
 - In Afrikaans: indicates morphophonologic class of adjectives (Lass 1990). Complex adjectives have -e

Case study 1: nominal n-inflection in Gm.

-n affix

- n-affix in nouns: plural (PD Dutch *bord* – *borden* ('plate(s)'))
- in successive steps:
 - feminine n-stems: *tonge*_{SG} – *tongen*_{PL}
 - feminine o-stems: *siele*_{SG} – *siele*_{PL} > *sielen*_{PL}
 - retraction of n from ACC.SG of n-stems: *hanen*_{SG.ACC} > *hane*_{SG} – *hanen*_{PL}
 - extension to nouns on -e, e.g. u-stem *sone*: *sone*_{SG} – *sone*_{PL} > *sonen*_{PL}
 - extension to nouns in -Ø: *dag*_{SG} – *daghe*_{PL} > *dagen*_{PL}

Case study 1: nominal n-inflection in Gm.

-n affix: Summary

Derivational suffix (nomina agentis?) (PIE)



Individual-level property nouns (Proto-Germanic)



Adjective ending (Common Germanic)



Definiteness marker (Old Dutch)



Gender/Number marker (PD Dutch)



Attributiviser (Post-PD Dutch)



Adjective-class marker (Afrikaans)



Pluraliser (PD Dutch)

Case study 2: verbal o-grade in Germanic

- (Post-anatolian) PIE stems, differentiated for aspect (lexical > gramm.):
 - present stems: atelic > imperfective
 - aorist stems: telic > perfective
 - perfect stems: stative
- vowel grades with aspectual value

	stem	e grade	o grade	zero grade
PIE		present	perfect	aorist
Class. Greek	<i>l_ip</i>	<i>leíp-ō</i>	<i>lé-l^oip-a</i>	<i>é-lip-on</i>
PGM		non-past	preterite sg	preterite pl
Gothic/Old Dutch		<i>bi-leib-an</i>	<i>bi-l^oaif</i>	<i>be-lib-en</i>

- Exaptation 1 of o-grade: PIE stative > PGM preterite SG

Case study 2: verbal o-grade in Germanic

- vowel grades with aspectual value

	stem	e grade	o grade	zero grade
PGM		non-past	preterite sg	preterite pl
Gothic/Old Dutch		<i>bi-leib-an</i>	<i>bi-laif</i>	<i>be-lib-en</i>

- Some Germanic verbs (strong Class VII) did not have ablaut, but reduplication:
 - Gothic: *haitan* ~ *haihait*; *haldan* ~ *haihald*; *slepan* ~ *saíslep*
 - These verbs had /a/ instead of /e/ in the present.
 - This /a/ was seen as related to the o-grade (and sometimes it actually was, e.g. *haitan* < PIE **k^hoih₂-d-* , root **keih₂-*)
 - The reduplication was remodeled in West-Germanic to fit the ablaut pattern (but mirror-wise, see Van Coetsem 1956, 1983): PGM **haitan* (h = χ)

PGM	<i>*χait-</i> ~ <i>*χe-gait</i>
PRE-WG	<i>*χait-</i> ~ <i>*χe-ga-it</i> > <i>*χěit</i> (with a-umlaut) > <i>*χē₂t</i>
WG	<i>hêt-</i> ~ <i>*hiæt-</i> > <i>hiet</i>
- Exaptation 2 of o-grade: PIE derivation > PGM present

Case study 2: verbal o-grade in Germanic

- (Post-anatolian) PIE stems, differentiated for aspect (lexical > gramm.):
 - present stems: atelic > imperfective
 - aorist stems: telic > perfective
 - perfect stems (o-grade): stative
- The PIE perfect was reanalysed as a tense category in PGM
- There was a set of perfects that continued the old stative function
- These verbs have 'present' meaning and 'preterite' morphology in PGM. For the past tense, they formed weak preterites. These are called: 'preterite-presents'.
 - PIE **wóyde* 'he knows' > PGM **wait*
 - PIE **dʰedʰórse* 'he dares' > PGM **(ga)dars*
 - PIE **memónē* 'he remembers' > PGM **(ga)man*
 - PIE **h₂eh₂ó(n)ké* 'he is at/has reached' > PGm **ganah* 'it is enough'
 - PIE **h₂eh₂óyke* 'he possesses' > PGM **aih*
 - PIE **h₂eh₂óghe* 'he is upset' > PGM **ōg* 'he is afraid'
 - PIE **tetórpe* 'he enjoys' > PGM **parf* 'he needs'
 - PIE **dʰedʰówgʰe* 'it is productive' > PGM **daug* 'it is useful'
 - PIE **h₁eh₁óre* 'he is here/has arrived' > PGM **ar* 'he is'

Case study 2: verbal o-grade in Germanic

- The preterite-presents thrived in Germanic
- There are preterite-presents that may even be innovations in Germanic (see Ringe 2006:154-155)
 - PIE **ǵneh₃* ‘to recognise’: pres. *ǵnnéh₃ti* > Pre-PGM **gunnāti*, new perf. **gegónne* > PGM **kann* ‘he knows’
 - PIE **h₃neh₂*- ‘to benefit’ > ? Pre-PGM perf. similar to **gunnāti* > PGM **ann* ‘he grants’
 - PIE **mog^h*- ‘to be able’ > ? perf. **memóg^he* > PGM **mag* ‘he can’
 - (Post-)PIE **skel*- ‘to owe’ > ? perf > PGM **skal* ‘he owes’
 - PIE ?? > PGM **mōt* ‘he is allowed to’
 - PIE ?? > PGM **lais* ‘he knows’
- Forms like **kann* are sometimes seen as an argument that the static passive is still productive in the post-PIE period
- But it could, alternatively, also indicate that the preterite-presents were shifting in function in Germanic: they may have been built analogically (see Prokosch 1939:188), and became markers of what would be come ‘modal auxiliaries’.
- Exaptation 3 of o-grade: PIE stative > PGM modal aux.

Case study 2: verbal o-grade in Germanic

Germanic verbal o-grade: summary

Derivational suffix (Pre-PIE)



Lexical aspect marker (stativity) (PIE)



Grammatical aspect marker (Post-PIE)



Preterite tense / concord marker (PGM)



Present tense marker (WGM)



Mod. aux (prt-prs) (PGM)

Case study 3: V1 word order in Germanic

- Word order in PGM
 - pragmatically regulated, with a V-late tendency (Burridge 1993; Faarlund 2001)
 - V1 in different contexts, not grammaticalised:
 - Presentatives
 - Emphatic verbs
 - ...

Sagdun thuo lof gode (OS 'Then they praised God')

uuarun thô hirta in thero lantskeffi (OHG 'there were pastors in that land')

uuas thar ouh sum uuitua in thero burgi (OHG 'there also was a certain widow in that city').

Case study 3: V1 word order in Germanic

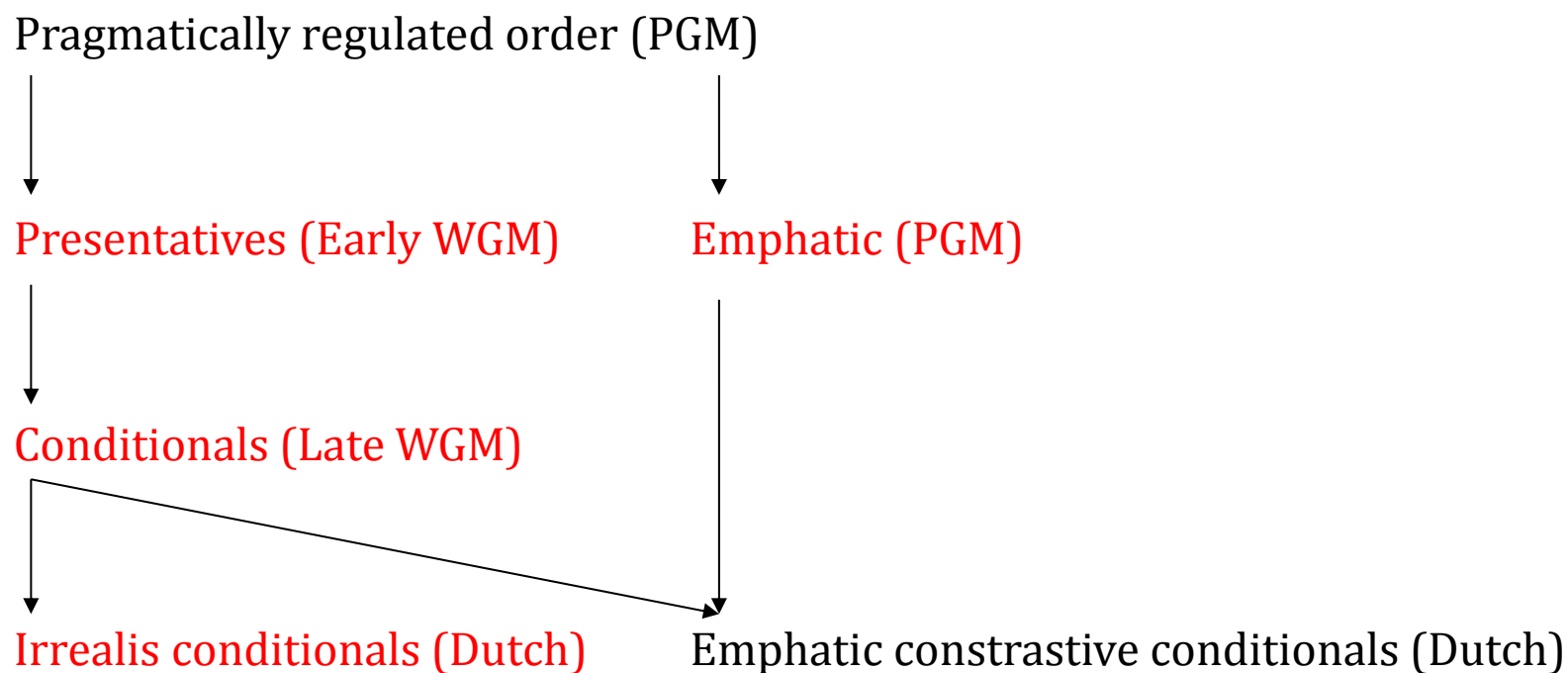
- Rise of V2 in Germanic (Kiparsky 1995, among many others)
- As a result, function of V1 and V-late changes (Hopper 1975; Van der Horst 2008)
- V1:
 - wishes, commands, yes/no questions, conditionals ...
 - non-assertivity , extra-sequential clauses ...
- Exaptation 1: V1-conditionals
 - *Leystestu mir thie truwa, sih, welicha genatha ich thir skeinon noh in thirro werelde!* (Old Dutch, 'If you pledge allegiance to me, then notice which mercy I show you yet in this world')
 - *viele ik ouch van then wolken zo ther erthen, mir nemohte nechein scathe werthen* (Old Dutch 'If I would fall from the clouds to the earth, then no harm would come to me')

Case study 3: V1 word order in Germanic

- V1-conditionals
- New way of expression conditionals: proliferation of conjunctions ("conjunctive drift", Leuschner & Van den Nest, p.c.)
- The emerging V1-conditionals enter into competition with syndetic conditionals (although there is some discussion on the relative chronology)
- V1-conditionals specialise to non-realis contexts (Van den Nest 2010)
 - *Ze zouden den hemel en de aarde hebben omvergehaald **hadden** zij er u maar mee kunnen behouden* (19th century Dutch 'they would have torn down heaven and earth, if they would have been able to save you')
- V1-conditionals with emphatic verbs
 - *Bák ik eens een cake, éét hij die niet op* ('Now that I bake a cake, he doesn't eat it')
- Exaptation 2: V1-irrealis conditionals

Case study 3: V1 in Germanic

V1 in Germanic: summary



Other cases of cyclic exaptation

- -n- suffix for causatives and infinitives (Wischer 2010)
- -sk- affix in Romance (Giacalone Ramat 1998: 110-111)
- ... ?

Conclusions

1. Not all is regularity, smooth transitions, and predictable changes in diachronic linguistics (as grammaticalisation studies seem to suggest)
2. Language users work on local generalisations
3. This can be captured by the idea of exaptation
4. Exaptation is thought to be an idiosyncratic, one-off process (Heine 2003:172), but in fact, it can be cyclic.
5. As a label, exaptation underscores unexpectedness in change
 - Note that a label is not an explanation (Same for *reanalysis*: a label, not an explanation).
 - The resistance against exaptation as a fruitful concept in diachronic linguistics often has to do with the unreasonable expectation that it should be an explanation.